UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,590	11/07/2001	Thomas W. Smith	D/A1503	4094

7590 04/25/2005

Patent Documentation Center
Xerox Corporation
Xerox Square 20th Floor
100 Clinton Ave. S,
Rochester, NY 14644

EXAMINER	
SHOSHO, CALLIE E	
ART UNIT	**PAPER NUMBER**
1714	

DATE MAILED: 04/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/036,590
Filing Date: November 7, 2001
Appellant(s): SMITH ET AL.

Judith Byorick
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/17/04 appealing from the office action mailed 7/15/04.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

6,054,505	Gundlach et al.	4-2000
5,686,633	Vieira et al.	11-1997
4,256,493	Yokoyama et al.	3-1981
5,855,657	Bergthaller et al.	1-1999
6,432,523	Ma et al.	8-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

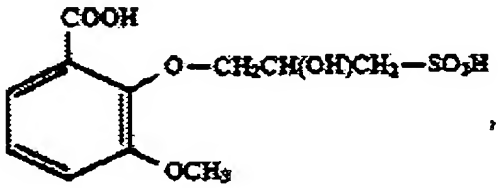
1. Claims 1-8, 11-20, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gundlach et al. (U.S. 6,054,505) in view of Vieira et al. (U.S. 5,686,633).

Gundlach et al. disclose ink comprising water, 0.1-40% nonpolymeric salt, 1-5% anionic dye, and polyquaternary amine such as polydiallyl dimethyl ammonium, polyquaternized polyvinylamine, polyquaternized polyallylamine, epichlorohydrin/amine, cationic amido amine, and copolymer of vinyl pyrrolidone and vinyl imidazolium salt. The anionic dye includes anionic dyes including Acid Red 52, Acid Yellow 23, and Acid Blue 9. It is further disclosed that the

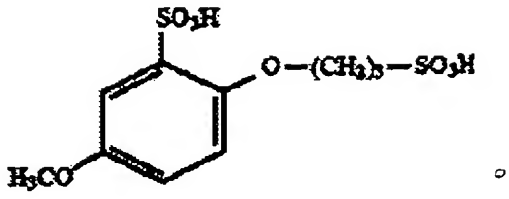
above ink is preferably printed using thermal ink jet printer but Gundlach et al. also disclose the use of other conventionally known ink jet printing methods including acoustic ink jet printing and piezoelectric ink jet process (col.1, lines 41-43 and 44-47, col.2, line 46-col.3, line 3, col.6, lines 62-65, col.7, lines 25-27 and 40-55, col.8, lines 21 and 26-67, col.13, lines 31-32, col.14, lines 26 and 40-41, col.15, lines 42-45, col.19, lines 51-58, col.22, lines 35-38, and col.23, lines 18-24).

The difference between Gundlach et al. and the present claimed invention is the requirement in the claims of (a) anionic lightfastness-imparting agent and (b) the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

With respect to difference (a), Vieira et al., which is drawn to ink jet inks, disclose the use of 0.01-30% anionic lightfastness imparting agent identical to that presently claimed such as 2,3-dimethoxybenzoic acid, 3,4,5-trimethoxybenzoic acid, 4,5-dimethoxyphthalic acid, 2,3-bis-(carboxymethyloxy)-benzoic acid,



OR



The motivation for using these lightfastness imparting agents is to produce stable ink that will not fade or discolor (col.1, lines 6-10, 25-26, and 36-38, col.6, lines 57-58, col.18, lines 40-58, col.19, lines 40-45, and col.20, lines 15-20).

Although there is no disclosure in either Gundlach et al. or Vieira et al. of complex of dye, polyquaternary amine, and lightfastness imparting agent as presently claimed, given that Gundlach et al. disclose that upon mixing the ink ingredients, the anionic dye and the polyquaternary amine compound form a complex (col.15, lines 42-50) and given that Gundlach et al. in view of Vieira et al. disclose anionic dye, polyquaternary amine, and lightfastness imparting agent identical to those presently claimed, it is clear that these ingredients will intrinsically form a complex.

In light of the motivation for using lightfastness imparting agents disclosed by Vieira et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such lightfastness imparting agent in the ink of Gundlach et al. in order to produce stable ink that will not fade or discolor, and thereby arrive at the claimed invention.

With respect to difference (b), it is noted that Gundlach et al. disclose that the number of cationic sites on the polyquaternary amine compound must be larger than the number of anionic sites on the dye in order to avoid the polymer from precipitating, however, there is no explicit

disclosure of the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

However, given that Gundlach et al. disclose that the number of cationic groups should be larger than the number of anionic groups in order to avoid precipitation, it would have been obvious to one of ordinary skill in the art to control the number of cationic sites on the polyquaternary amine per one anionic site on the dye or per one anionic site on the lightfastness imparting agent to values, including that presently claimed, in order to prevent precipitation and to produce an ink with excellent shelf stability, and thereby arrive at the claimed invention.

2. Claims 1-7, 11-20, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gundlach et al. (U.S. 6,054,505) in view of Yokoyama et al. (U.S. 4,256,493).

Gundlach et al. disclose ink comprising water, 0.1-40% nonpolymeric salt, 1-5% anionic dye, and polyquaternary amine such as polydiallyl dimethyl ammonium, polyquaternized polyvinylamine, polyquaternized polyallylamine, epichlorohydrin/amine, cationic amido amine, and copolymer of vinyl pyrrolidone and vinyl imidazolium. The anionic dye includes anionic dyes including Acid Red 52, Acid Yellow 23, and Acid Blue 9. It is further disclosed that the above ink is preferably printed using thermal ink jet printer but Gundlach et al. also disclose the use of other conventionally known ink jet printing methods including acoustic ink jet printing and piezoelectric ink jet process (col.1, lines 41-43 and 44-47, col.2, line 46-col.3, line 3, col.6, lines 62-65, col.7, lines 25-27 and 40-55, col.8, lines 21 and 26-67, col.13, lines 31-32, col.14,

lines 26 and 40-41, col.15, lines 42-45, col.19, lines 51-58, col.22, lines 35-38, and col.23, lines 18-24).

The difference between Gundlach et al. and the present claimed invention is the requirement in the claims of (a) anionic lightfastness-imparting agent and (b) the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

With respect to difference (a), Yokoyama et al., which is drawn to ink jet inks, disclose the use of UV absorbing agent such as 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid or 2,2'-dihydroxy-4,4'-dimethoxybenophenone-5-sulfonic acid in order to produce ink with good resistance to light that will not clog the printer nozzles (col.3, lines 2-26 and 38-60).

Although there is no disclosure in either Gundlach et al. or Yokoyama et al. of complex of dye, polyquaternary amine, and lightfastness imparting agent as presently claimed, given that Gundlach et al. disclose that upon mixing the ink ingredients, the anionic dye and the polyquaternary amine compound form a complex (col.15, lines 42-50) and given that Gundlach et al. in view of Yokoyama et al. disclose anionic dye, polyquaternary amine, and lightfastness imparting agent identical to those presently claimed, it is clear that these ingredients will intrinsically form a complex.

In light of the motivation for using anionic lightfastness imparting agents disclosed by Yokoyama et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such lightfastness-imparting agent in the ink of Gundlach et al. in order to

produce ink with good resistance to light that will not clog the printer nozzles, and thereby arrive at the claimed invention.

With respect to difference (b), it is noted that Gundlach et al. disclose that the number of cationic sites on the polyquaternary amine compound must be larger than the number of anionic sites on the dye in order to avoid the polymer form precipitating, however, there is no explicit disclosure of the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

However, given that Gundlach et al. disclose that the number of cationic groups should be larger than the number of anionic groups in order to avoid precipitation, it would have been obvious to one of ordinary skill in the art to control the number of cationic sites on the polyquaternary amine per one anionic site on the dye or per one anionic site on the lightfastness imparting agent to values, including that presently claimed, in order to prevent precipitation and to produce an ink with excellent shelf stability, and thereby arrive at the claimed invention.

3. Claims 1-4 and 10-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Gundlach et al. (U.S. 6,054,505) in view of either Bergthaller et al. (U.S. 5,855,657) or Ma et al. (U.S. 6,432,523).

Gundlach et al. disclose ink comprising water, 0.1-40% nonpolymeric salt, 1-5% anionic dye including Acid Red 52, Acid Yellow 23, and Acid Blue 9, and polyquaternary amine such as polydiallyl dimethyl ammonium, polyquaternized polyvinylamine, polyquaternized polyallylamine, epichlorohydrin/amine, cationic amido amine, and copolymer of vinyl

pyrrolidone and vinyl imidazolium. It is further disclosed that the above ink is preferably printed using thermal ink jet printer but Gundlach et al. also disclose the use of other conventionally known ink jet printing methods including acoustic ink jet printing and piezoelectric ink jet process (col.1, lines 41-43 and 44-47, col.2, line 46-col.3, line 3, col.6, lines 62-65, col.7, lines 25-27 and 40-55, col.13, lines 31-32, col.14, lines 26 and 40-41, col.15, lines 21 and 42-45, col.19, lines 51-58, col.22, lines 35-38, and col.23, lines 18-24).

The difference between Gundlach et al. and the present claimed invention is the requirement in the claims of (a) anionic lightfastness-imparting agent and (b) the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

With respect to difference (a), Bergthaller et al., which is drawn to ink jet ink containing dyes including anionic dyes such as Acid dyes, disclose the use of 0.2-8% thiosulfate, trithionate, or tetrathionate salts in order to produce ink with improved color fastness (col.1, lines 34-41 and col.5, line 40).

Alternatively, Ma et al., which is drawn to ink jet inks, disclose the use of 1-8% thiosulfate salt in order to improve lightfastness (col.5, lines 63-66).

In light of the motivation for using anionic lightfastness agent disclosed by either Bergthaller et al. or Ma et al., it therefore would have been obvious to one of ordinary skill in the art to use such lightfastness agent in the ink of Gundlach et al. in order to produce ink with improved color fastness or lightfastness, and thereby arrive at the claimed invention.

With respect to difference (b), it is noted that Gundlach et al. disclose that the number of cationic sites on the polyquaternary amine compound must be larger than the number of anionic sites on the dye in order to avoid the polymer form precipitating, however, there is no explicit disclosure of the number of cationic sites on the polyquaternary amine per one anionic site on the dye or the number of cationic sites on the polyquaternary amine per one anionic site on the lightfastness imparting agent.

However, given that Gundlach et al. disclose that the number of cationic groups should be larger than the number of anionic groups in order to avoid precipitation, it would have been obvious to one of ordinary skill in the art to control the number of cationic sites on the polyquaternary amine per one anionic site on the dye or per one anionic site on the lightfastness imparting agent to values, including that presently claimed, in order to prevent precipitation and to produce an ink with excellent shelf stability, and thereby arrive at the claimed invention.

(10) Response to Argument

Prior to responding to appellants' arguments, it is noted that all the present claims require complex of (i) anionic dye, (ii) anionic lightfastness-imparting agent, and (iii) polyquaternary amine compound.

Gundlach et al. disclose ink comprising complex of (i) anionic dye and (iii) polyquaternary amine compound, however, there is no disclosure of complex also including (ii) anionic lightfastness-imparting agent as presently claimed. This is why Gundlach et al. is combined with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. which are

each drawn to ink compositions and which each disclose anionic lightfastness-imparting agent identical to those presently claimed.

It is the examiner's position that the combination of Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al., would produce complex of (i) anionic dye, (ii) anionic lightfastness-imparting agent, and (iii) polyquaternary amine compound as presently claimed.

Evidence to support examiner's position is found in the examples of the present specification.

Attention is drawn to examples IV and VIII, for instance, of the present specification that disclose that the ink of the present invention is prepared by first forming complex of polyquaternary amine compound (iii), i.e. polydimethyldiallylammonium, with anionic dye (i), i.e. Acid Yellow 23, followed by adding this complex to additional ink ingredients including anionic lightfastness-imparting agent (ii), i.e. 2,2-dihydroxy-4,4-dimethoxy-benzophenone-5-sulfonic acid, sodium salt, to form ink comprising complex of (i), (ii), and (iii). This is the exact situation found when combining the prior art cited by the examiner. That is, Gundlach et al. disclose ink comprising complex of polyquaternary amine compound and anionic dye while Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. each disclose motivation to add anionic lightfastness-imparting agent identical to those presently claimed to such ink. Based on the examples of the present specification, it is clear that such combination of polyquaternary amine/anionic dye complex with anionic lightfastness-imparting agent would intrinsically result in the formation of complex of (i) anionic dye, (ii) anionic lightfastness-imparting agent, and (iii) polyquaternary amine compound as presently claimed.

Thus, appellants own specification provides clear evidence that combination of Gundlach et al. with Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. as disclosed by the examiner will produce ink comprising complex identical to that presently claimed.

Appellants argue that there is no motivation to combine Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. given that Gundlach et al. neither teach or suggest the use of anionic lightfastness-imparting agent and given that Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. do not teach or suggest that anionic lightfastness-imparting agent could or should form complexes with the other ink ingredients. Appellants also argue that none of Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. disclose polyquaternary amine compound as presently claimed.

It is agreed that there is no disclosure of Gundlach et al. of anionic lightfastness-imparting agent as presently claimed. This is why Gundlach et al. is combined with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. which each disclose anionic lightfastness agent identical to that presently claimed. It is noted that while there is no explicit disclosure in Gundlach et al. of anionic lightfastness agent, Gundlach et al. do disclose that the ink is open to the inclusion of any additional ink additives (col.23, lines 38-39).

It is the examiner's position that there is motivation to combine Gundlach et al. with Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. for the following reasons.

Gundlach et al. disclose ink comprising water and complex of anionic dye and polyquaternary amine compound. Each of Vieira et al., Yokoyama et al., Bergthaller et al., and Ma et al., which are each also drawn to inks comprising dye (including anionic dye as disclosed

by Vieira et al., Yokoyama et al., or Bergthaller et al.), provides motivation for using anionic lightfastness-imparting agent, i.e. produce stable ink that will not fade or discolor (Vieira et. al.), produce ink with good resistance to light (Yokoyama et al.), to produce ink with improved lightfastness (Bergthaller et al.), or to produce ink with improved lightfastness (Ma et al.). Thus, given that each of Vieira et al., Yokoyama et al., Bergthaller et al., and Ma et al. is drawn to the same field of endeavor as Gundlach et al., i.e. inks, and given that each of Vieira et al., Yokoyama et al., Bergthaller et al., and Ma et al. disclose good motivation for using anionic lightfastness-imparting agent, it is the examiner's position that there is proper motivation to combine Gundlach et al. with Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al.

Appellants also argue that none of the cited references suggests or teaches the desirability of combining the elements of the present invention as claimed and that obviousness cannot be established by combining references to arrive at the claimed invention absent some teaching, suggestion, or incentive to support the combination. However, as stated in the preceding paragraph, there is clear teaching in each of the prior art references that support the combination of references set forth by the examiner.

Although it is agreed that there is no disclosure in either Gundlach et al., Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. that the polyquaternary amine, anionic dye, and anionic lightfastness-imparting agent should or would form a complex, given that each combination of cited prior art applied against the present claims discloses polyquaternary amine compound, anionic dye, and anionic lightfastness-imparting agent identical to those presently claimed, given that there is good motivation to combine the references, given that Gundlach et al. disclose that upon mixing, the anionic dye and polyquaternary amine compound form a complex,

and given that the appellants own specification discloses that the presently claimed complex is formed by first forming complex of polyquaternary amine with anionic dye followed by mixing this complex with anionic lightfastness-imparting agent, it is clear that, contrary to appellants' arguments, one would expect the combination of polyquaternary amine, anionic dye, and anionic lightfastness-imparting agent to form complex and that the combination of Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. would result in ink comprising complex identical to that presently claimed.

Appellants argue that one would not be led to make an ink wherein both an anionic dye and anionic lightfastness agent are complexed to polyquaternary amine. However, given that there is motivation to combine Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. as described above, it is clear that upon mixing the anionic dye, polyquaternary amine, and anionic lightfastness-imparting agent disclosed by the combination of Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al., a complex would intrinsically form.

Although the motivation to combine Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. is not to form a complex, the fact remains that upon mixing, such complex would intrinsically form. Further, it is noted that "obviousness under 103 is not negated because the motivation to arrive at the claimed invention as disclosed by the prior art does not agree with appellant's motivation", *In re Dillon*, 16 USPQ2d 1897 (Fed. Cir. 1990), *In re Tomlinson*, 150 USPQ 623 (CCPA 1966).

With respect to appellants' arguments that there is no disclosure in either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. of polyquaternary amine compound, note that each of Vieira et al., Yokoyama et al., Bergthaller et al., and Ma et al. is used as teaching reference, and therefore, it is not necessary for these secondary references to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather these references teach a certain concept, namely the use of anionic lightfastness agents in ink jet inks, and in combination with the primary reference, disclose the presently claimed invention.

Appellants argue that the examiner used hindsight when combining Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. and cite case law to support their position.

However, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Thus, it is the examiner's position that the combination of Gundlach et al. with either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. is not based on hindsight but rather based on the fact that each reference is drawn to ink jet inks and given that there is proper motivation for combining either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. with Gundlach et al.

Appellants also argue that the criteria for the determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success. Both the suggestion and expectation of success must be found in the prior art, not in the Appellants' disclosure.

However, given that Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. each disclose that the use of anionic lightfastness agent in ink jet inks containing dyes produces ink with improved colorfastness or lightfastness, it is clear that it is the prior art that suggests to one of ordinary skill in the art to utilize the anionic lightfastness agent in the ink jet ink of Gundlach et al. Further, given that Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al.are drawn to ink jet inks as is Gundlach et al. and given that Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. each disclose the advantages of using anionic lightfastness agents, it is clear that it is the prior art, not appellants disclosure, that sets forth an expectation of success for using the anionic lightfastness-imparting agents of either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al.

Appellants also argue that in combining Gundlach et al. with Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. , the examiner is using an obvious to try standard and cite case law to support their position.

It is noted that Gundlach et al. disclose ink jet ink comprising water, non-polymeric salt, anionic dye, and polyquaternary amine compound, but there is no disclosure of anionic lightfastness agent. This is why Gundlach et al, is used in combination with Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. which are drawn to ink jet ink comprising dye

(including anionic dye as found in Vieira et al., Yokoyama et al., and Bergthaller et al.) and anionic lightfastness agent. Given the disclosure of Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al., it is the examiner's position that an "obvious to try" standard was not used when combining Gundlach et al. with each of these references. Rather, the references were combined given that there is motivation for one of ordinary skill in the art to combine Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. with Gundlach et al., namely, the use of anionic lightfastness agent as presently claimed would function so as to improve the colorfastness or lightfastness of the ink.

Further, it is noted that the courts have held that "the motivation to combine can arise from the knowledge that the prior art elements will perform their expected functions to achieve their expected results when combined for their common purpose." *Miles Lab, Inc. v. Shandon Inc.* 997 F.2d at 878, 27 USPQ 2d 1123, 1128 (Fed.Cir. 1993). In light of this, appellants' position that the examiner is using an obvious to try standard is refuted. Based on the teachings of Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al., one of ordinary skill in the art would have recognized that anionic lightfastness agents as disclosed by either Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. would function to improve colorfastness or lightfastness when used in inks and would have expected the lightfastness agents to function as such in other inks including that of Gundlach et al. Therefore, the examiner has established a prima facie case of obviousness.

Appellants argue that there is no disclosure in any of the references that the number of cationic sites on the polyquaternary amine for every one anionic site on the anionic lightfastness agent is at least 1 to less than 5 as required in present claim 12.

While it is agreed that there is no explicit disclosure in any of the cited references regarding the number of cationic sites on the polyquaternary amine for every one anionic site of the anionic lightfastness agent and that the only disclosure in Gundlach et al. is that the number of cationic sites on the polyquaternary amine must be larger than the number of anionic sites on the anionic dye, it is the examiner's position that it would have been obvious to, as well as within the skill level of, one of ordinary skill in the art, absent evidence to the contrary, to recognize that the number of cationic sites on the polyquaternary amine must be larger than the number of anionic sites present in the ink regardless of whether the ratio is relative to anionic dye or anionic lightfastness agent. That is, precipitation will occur if the number of cationic sites is less than the number of anionic sites regardless of whether the anionic sites are present from the dye or the lightfastness agent. Based on the disclosure of Gundlach et al., it therefore would have been obvious to one of ordinary skill in the art to control the number of cationic sites on the polyquaternary amine per one anionic site on the anionic lightfastness agent to values, including that presently claimed, in order to prevent precipitation, and thus, one of ordinary skill in the art would have arrived at the present invention.

Appellants also argue that there is no disclosure of ratio of dye to anionic lightfastness agent wherein the ratio is at least about 3:1 to no more than 20:1 as required in claim 13.

However, it is noted that col.5, lines 26-32 of Yokoyama et al. disclose that the ratio of anionic dye to UV absorbing agent, i.e. anionic lightfastness-imparting agent, is 0.1-10:0.2-10 or 0.01:1 to 50:1. Further Gundlach et al. disclose using 1-5% anionic dye, while Vieira et al., Bergthaller et al., and Ma et al. disclose using 0.1-2%, 0.2-8%, and 1-8% anionic lightfastness agent, respectively. Thus, when combining Gundlach et al. with either Vieira et al., Bergthaller et al., or Ma et al., it is calculated that the ratio of anionic dye to anionic lightfastness agent is 0.1: to 50:1 (Vieira et al.), 0.125:1 to 5:1 (Bergthaller et al.), and 0.125:1 to 50:1 (Ma et al.).

Appellants argue that the ratio disclosed by Yokoyama et al. is for ingredients moving freely in aqueous inks not ingredients complexed to polyquaternary amine. While examiner agrees, based on this disclosure, one skilled in the art would have recognized that such ratio would equally apply when the anionic dye and anionic lightfastness-imparting agent were utilized together in a complex.

Appellants also argue that the ratio disclosed by Yokoyama et al. is much broader than that presently claimed. However, it is clear that ratio disclosed by Yokoyama et al. clearly overlaps that presently claimed. Thus, absent evidence to the contrary, it therefore would have been obvious to one of ordinary skill in the art to choose ratio of anionic dye to anionic lightfastness-imparting agent, including that presently claimed, and thereby arrive at the claimed invention.

It is noted that the present specification comprises comparative data (page 45) wherein ink within the scope of the present claims, i.e. comprising anionic lightfastness agent, is

compared with ink outside the scope of the present claims, i.e. comprising no anionic lightfastness agent. It is shown that the ink of the present invention is superior in terms of lightfastness. However, the data does not establish unexpected or surprising results over the cited prior art given that Vieira et al., Yokoyama et al., Bergthaller et al., or Ma et al. each already disclose the criticality of using anionic lightfastness agents to produce ink that will not fade and that possesses good resistance to light.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
April 15, 2005

Conferees

Vasu Jagannathan

James Seidleck

Patent Documentation Center
Xerox Corporation
Xerox Square 20th Floor
100 Clinton Ave. S,
Rochester, NY 14644